**Yogurt**

**by Gwendolyn D. Evans**

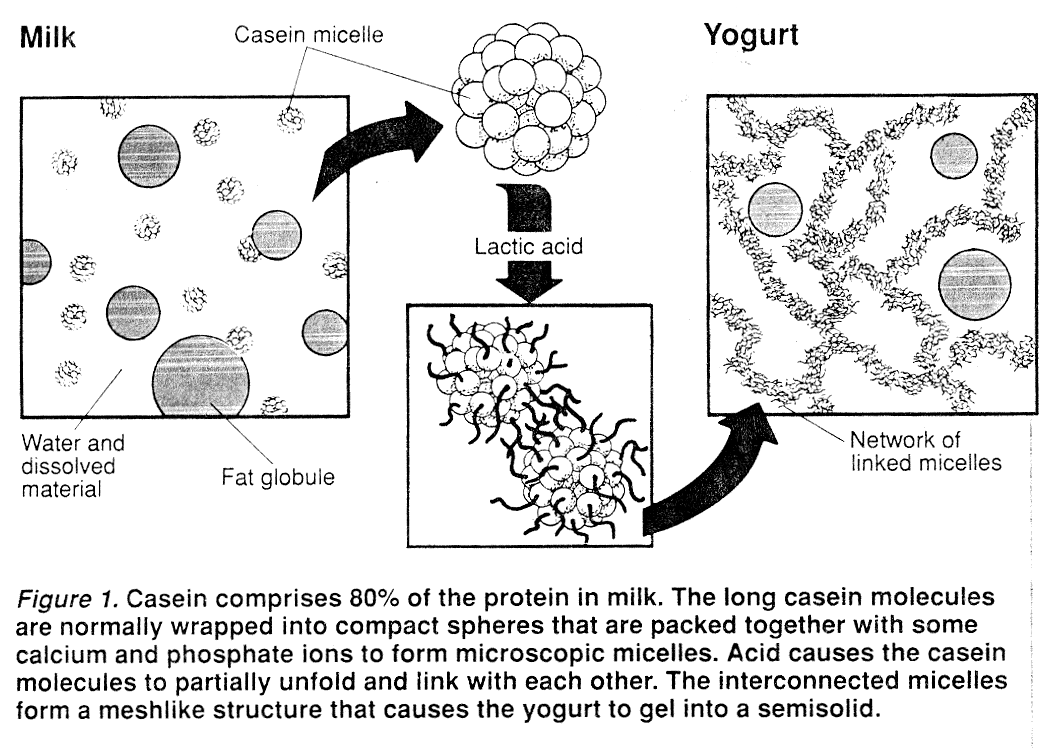
For many of us, yogurt is an unusual­ tasting food, but its history is even more unusual:

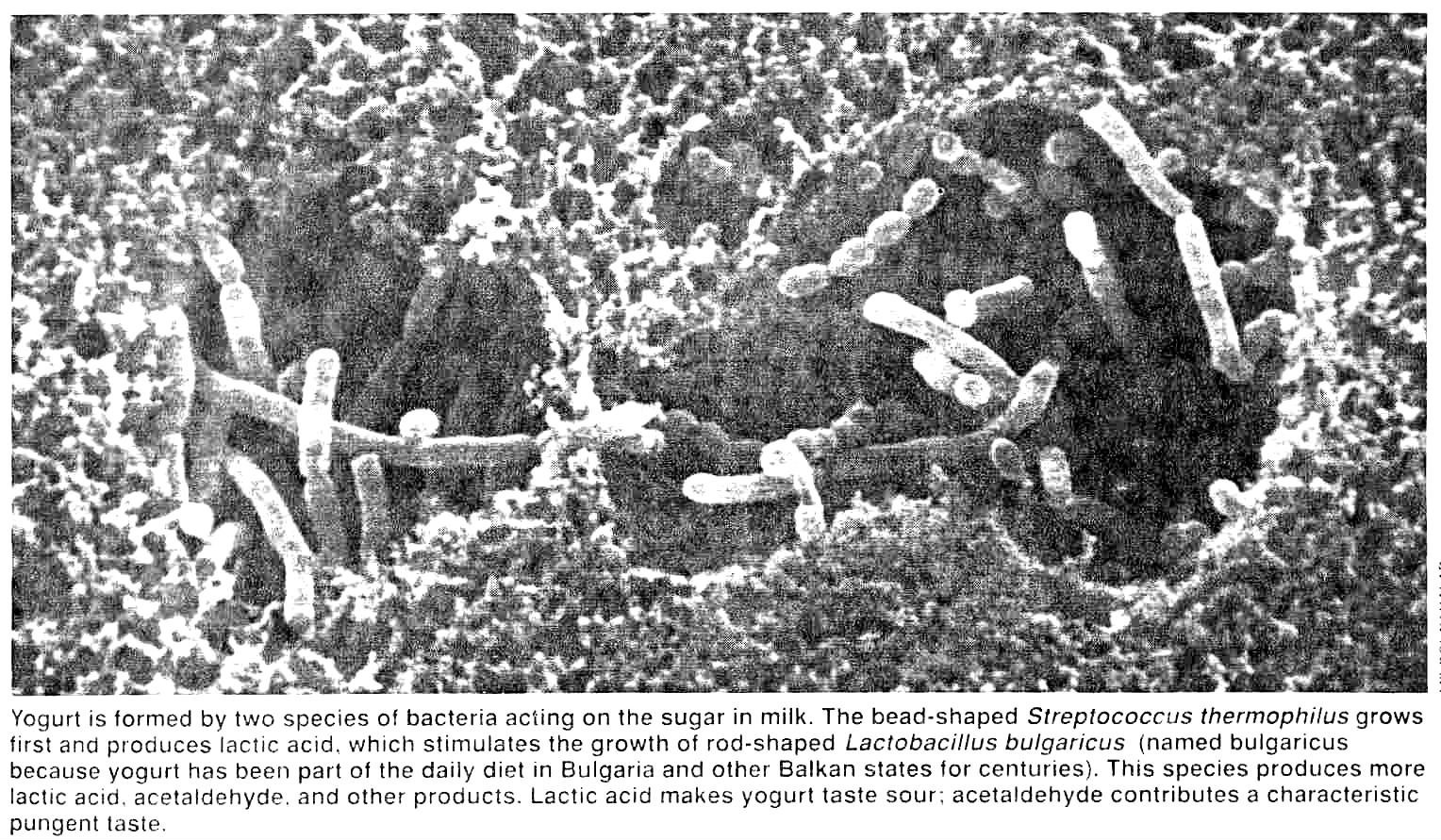
* Many centuries ago the Mongols of Asia were reported to eat a strange food that had medicinal properties, and it was said that they enhanced its flavor by mixing the sour-tasting food with the blood of horses.
* When the secret recipe of this food, which was believed to extend human life, was brought from Constantinople to France, King Francis I bought the formula for a large sum.
* In 1931 a Spanish businessman, Isaac Carasso, produced the food and sold it in pharmacies through­out Europe. With the advent of World War II, Carasso's son, Daniel, brought the formula to the United States. The food-then named Danone, after Daniel was slow to catch on because people thought the sourness meant it had spoiled. When fruit was added to balance the sourness, sales of the product—renamed Dannon Yogurt—improved.
* In the 1970s, yogurt became known as a health food. Some people con­cluded that it mustbe good for you if health-conscious people were willing to eat something so sour.
* In 1985, television advertisements for Dannon Yogurt showed happy Asians eating lots of yogurt. They looked healthy and *very* old. The ads reinforced the notion that yogurt promotes longevity.

**Long life**

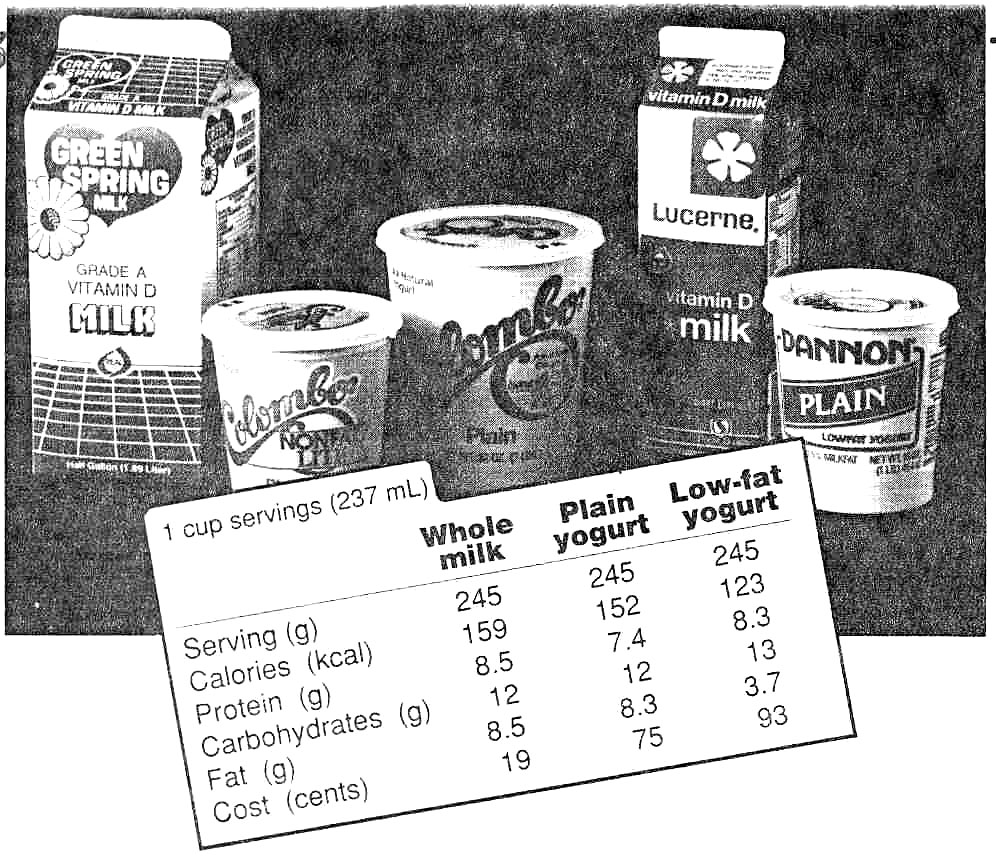
Scientific-sounding claims that yogurt is good for you can be traced to the turn-of-the-century theories of Elie Metchnikoff, a respected Russian biologist who won the Nobel Prize for medicine in 1908. Metchnikoff believed that our life span is limited by bacteria. In his book *The Prolongation of Life,* he stated that the intestinal tract harbored great numbers of bacteria that produced toxins that slowly poisoned the body and caused premature death. He called this process "**autointoxication by putrefactive bacteria**" and believed that surgical removal of the colon where the bacteria lived would extend human life. However, because colon surgery carried considerable risk, he recommended another treat­ment that he believed would rid the human intestine of harmful bacteria.

Metchnikoff had studied the culinary practices of French, Russian, and Bulgarian peasants and noted that the Bulgarians, who consumed about three quarts of yogurt a day, had remarkable longevity. He concluded that the lactobacilli bacteria, which are present in yogurt, establish colonies in the intestine and displace the harmful bacteria. Although it was unproven, Metchnikoff wrote books that popularized his theory. He also ate lots of yogurt and announced that he expected to live to the age of 150. Later, tests showed that the *Lactobacillus bulgaricus* bacteria do not colonize in the human intestine, leaving Metchnikoff with no scientific basis for his beliefs.

When we are born, our intestines are relatively sterile and free of bacteria. As daily food is consumed, the intestines quickly adopt colonies of bacteria. Adult intestines contain a vast range of flora, lactobacilli, strep­tococci, staphylococci, coliform bac­teria, and yeast. In this competitive environment, the yogurt bacteria are unable to establish colonies.

To be fair to Metchnikoff, the idea that intestinal bacteria can be harmful may have some merit. Today, medical experts say that there is a correlation between bowel cancer and the high dietary intake of animal fat and pro­tein. It is possible that the putrefactive bacteria (those that consume protein) may somehow produce carcinogenic compounds from cholesterol and bile salts. But even if this is so, eating lots of yogurt is not likely to be much of a remedy, because the bacteria in yogurt don't colonize in our digestive tract, and yogurt contains animal fat and protein. Where does this leave the health claims about yogurt? Is it good for you even if it doesn't make­ you live longer? Is it a good diet food? Let's look at how yogurt is made.

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| **Make your own cheese—a** variety that's called Leben or Labne and is popular in the Near East. Scoop a cup of plain yogurt onto a non-terry dish towel or lightweight handkerchief, then gather the edges and tie the top with a string. Hang this over a bowl at least eight hours to let the whey drain. Open the bag and spread the curd in a shallow bowl. Use the side of a spoon to carve a shallow channel around the outer edge and, pour in a little extra virgin olive oil. Decorate the top with a touch of parsley and ground red pepper, refrigerate, and use as a spread on bread, crackers, or bagels labne is especially good as a side dish with spicy foods.  **Peggy Corrigan** |

**Making it all gel**

Yogurt is fermented milk, a product that can easily be made at home. From the cook's point of view, two major changes take place when milk is converted to yogurt: It turns from sweet to sour, and from liquid to a semisolid gel. These changes are caused by the bacteria *Lactobacillus bulgaricus* and *Streptococcus ther­mophilus.* Cows' milk contains about 4.8% lactose and the bacteria con­sume much of this sugar, producing the sour-tasting lactic acid, C2H4(OH)COOH. It is this acid that causes protein in the milk to coagulate.

Milk contains many types of protein, and the type known as casein is involved in making yogurt. Casein molecules are normally packed into microscopic bundles called micelles. At milk's normal pH of 6.5, the micelles are dispersed throughout the liquid. As the lactic acid builds up, the pH gradually drops to 4.5, and the acid alters the casein molecules so that the micelles link together in chains and clusters (see Figure 1). The linked micelles form a semisolid network known as a gel. The other ingredients of the milk, such as vita­mins, enzymes, unfermented lactose, fat, and water, remain in the spaces of the gel-like protein network. During the conversion of milk to yogurt the amount of lactose is reduced, but the food value of the other components in milk is largely unchanged.

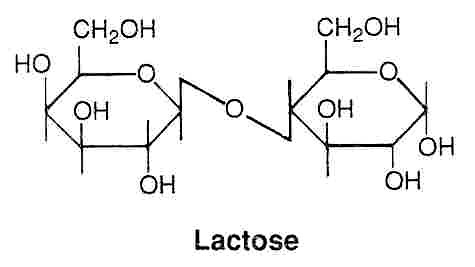
**Eat yourself skinny**

Many dieters have turned to yogurt in response to television advertisements showing stylish and skinny people eating yogurt instead of hamburgers. Some low-fat yogurt is advertised as having only 1 % fat. Although true, the implication that it is diet food may be misleading. Some popular brands are low in fat, but added sugar, fruit, and flavorings raise the caloric count. Yogurt has the calories of the milk it was made from, plus the calories of the milk solids that are often added to give it firmer "body," plus the calories of any added sugar and fruit. An 8­ ounce cup of fruit-flavored yogurt averages about 250 calories—the same as a small salad and an apple. Yogurt is nutritious because it is high in protein, riboflavin, and calcium, but compared to other diet foods it is not especially low in calories (see Figure 2). If you are on a diet, be sure to check the calories listed on the label.

**Lactose intolerance**

The sugar that is present in milk—lactose—is the all-important source of energy for nursing calves and babies lactose is a disaccharide, a sugar of two rings, that cannot be absorbed into the bloodstream until it has been broken into two smaller sugars by the enzyme lactase. (Note that the name of the sugar differs from the name of the digestive enzyme by just one let­ter.) The amount of lactase in your body is not constant. It reaches its maximum level in the human intes­tine shortly after birth, then declines between the ages of 11/2 and 31/2, when babies no longer need to drink milk. For most people, lactase pro­duction ceases by age three. How­ever, due to genetic differences, most people of European ancestry (or any location where people drink the milk of cows, goats, yaks, etc.) continue producing lactase at a lower level for the rest of their lives. This means that, as adults, they can drink moder­ate amounts of milk and easily digest the milk sugar.

However, some adults can't drink milk products without discomfort. In the absence of lactase the sugar passes through the small intestine without being absorbed and reaches the colon intact. There it nourishes bacteria that produce carbon dioxide and hydrogen. The gases and excess water cause severe abdominal cramps and bloating; the lactose and lactic acid increase osmosis within the colon, leading to water retention and diarrhea. This condition, called lactose intolerance, causes real abdominal distress.



Lactose intolerance was not recog­nized by western medical science until the 1960s. This relatively late recognition of a common problem probably occurred because in the United States only about 10% of Caucasians of European descent have lactose intolerance, compared to 70% of African-Americans. Most lactose-intolerant adults can con­sume only about a pint of milk per day without intestinal distress, but they can consume larger amounts of yogurt. This is because yogurt con­tains 25-50% less lactose than milk.

**Shortfall**

Should you eat yogurt? Sure if you like it. Will it help you lose weight? Perhaps, if you read the label and buy only the varieties that have fewer calories than the food you've been eating. Is it good for you? You bet-just like milk and fruit. Will it make you live longer? That brings us back to Elie Metchnikoff.

Metchnikoff, you recall, was the Russian biologist who popularized the notion that the lactobacilli in yogurt promote longevity and announced that he would live to be 150 years old. He continued to eat yogurt and write books until he died of old age at 71-just 79 years short of his goal.

*Gwendolyn D. Evans, a lactose-in tolerant writer living in Lithonia, Ga., makes her own yogurt. She would like to thank Manfred Kroger, Professor of Food Science at The Pennsylvania State* *University, and Miloslav Kalab, scientist at the Food Research Institute, Agriculture Canada. She extends a thank you to Ida Mae Harris, Toby McNease, and Lawrence Gordon, all of whom are over 100 years old (but don't eat yogurt) for contributing to her research.*

**Questions for the Article on Yogurt**

1. Where can the claims that yogurt is good for you be traced?

2. What did Metchnikoff believe cause premature death?

1. What is this process called?
2. What cure did he think would work? (What do you think of this idea?)
3. What group of people was long-lived?
4. What did Metchnikoff conclude from their eating habits?
5. When we are born what bacteria do we have in our intestines?
6. List the flora found in adult intestines.
7. Is there any merit to Metchnikoff idea? If so what?
8. What comprises 80% of the protein in milk?
9. Briefly describe the process that causes yogurt to gel into a semi-solid?
10. Name the two bacteria in yogurt and give the function of each. (under the picture)
11. What make yogurt taste sour?
12. Cow’s milk contains \_\_\_\_\_\_\_\_\_\_% of lactose.
13. In the section “eat yourself skinny”, what is the main idea and how do they support it?
14. Why is yogurt nutritious?
15. What is lactose? What enzyme breaks it down?
16. Is the level of lactase constant in a human? If not, when is it high? Low?
17. What is it called when adults can’t drink milk products because of the abdominal stress it causes?
18. What % of Caucasians in the U.S. have lactose intolerance?
19. What % of African-Americans have lactose intolerance?
20. What hypothesis can you state to account for the percentages in #20 and #21?
21. Metchnikoff said he would live 150 yrs. did he make it?